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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/327,621 | 06/08/1999 | HIROTO HORIKAWA | 101809.03 | 5673 |

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EXAMINER

KIM, PETER B

ART UNIT PAPER NUMBER

2851

DATE MAILED: 05/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/327,621

Applicant(s)

HORIKAWA, HIROTO

Examiner

Peter B. Kim

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26-94 and 97-104 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 26-37, 54-94 and 97-104 is/are allowed.
- 6) ☒ Claim(s) 38-42 and 45-53 is/are rejected.
- 7) ☒ Claim(s) 43 and 44 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 08/935,445.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 30.

- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

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DETAILED ACTION

Applicant's arguments filed on Mar. 21, 2003 (paper #31) have been fully considered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 38-42, and 45-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishi in view of Negishi.

Nishi discloses in Figures 1 and 2 and col. 8, line 14 through col. 10, line 4, a projection exposure apparatus with a base (19) which holds the scanning stage (first stage)(20) and the fine adjustment stage (second stage)(21) which holds the mask (7) and movable mirror (33, 34A, 34B) for laser interferometers (35, 36A, 36B) which detect a displacement of the fine adjustment stage. Nishi discloses the laser interferometer 35 located on base (19) that supports the first and the second stage (col. 9, lines 33-35). Nishi also discloses the illumination system (22), projection optical system (13), substrate (14) and substrate stage with movable mirror and laser interferometer. Nishi also discloses driving the fine adjustment stage to prevent a positional error when the scanning stage is accelerated or decelerated (col. 13, line 28-60). Although Nishi does not disclose the substrate located on the fine adjustment stage and the scanning stage, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the substrate stage with such an arrangement because Nishi teaches such arrangement with the mask stage. Nishi discloses a means for moving the scanning stage with electromagnetic

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actuators (Fig. 3), but Nishi does not disclose electromagnetic actuators for moving the fine adjustment stage. Nishi also does not disclose a cooling unit that cools the actuators with the cooling fluid from the actuators arranged in the direction perpendicular to the scanning direction with respect to the scanning stage. Negishi discloses in figures 1-4 and col. 3, line 20 – col. 7, line 35, electromagnetic actuators for moving the scanning stages of an exposure apparatus in x- and y-directions. Negishi discloses the stationary member having a coil of the electromagnetic actuator located on the stationary base relative to the moving stage and the movable magnetic portion located on the moving stage. Negishi discloses a pair of subactuators that are parallelly arranged (fig. 1, ref. 70a, 70b). Negishi also discloses cooling unit that cools the stationary member of the electromagnetic actuator in direction perpendicular and parallel to the scanning direction (Fig. 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to provide as the fine adjustment stages, the stage with electromagnetic actuators and the cooling unit in view of Negishi to the invention of Nishi in order to more efficiently produce semiconductor elements or liquid crystal display element which is well known product of scanning exposure apparatus. Also, since Negishi teaches cooling of the stationary member of the actuator in order to prevent flexure of the movable member due to the heat in col. 1, lines 43-66, it would be obvious to provide cooling to actuators of the scanning stage as well as the fine adjustment stage.

Allowable Subject Matter

Claims 26-37, 54-94, and 97-104 are allowed.

Claims 43 and 44 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

None of the prior art of record teaches the cooling unit circulating the cooling fluid from a portion near an optical path of the light beam from the interferometer toward the first coil member or the second coil member in combination with the stage apparatus comprising a first and a second stage.

None of the prior art of record teaches a stage apparatus comprising a first stage and a second stage, a first actuator driving the second stage and a second actuator to drive the second stage with a thrust larger than the thrust by the first actuator.

Response to Arguments

Applicant argues that the prior art does not disclose the interferometer located on the base. However, Nishi discloses the laser interferometer 35 located on base (19) that supports the first and the second stage (col. 9, lines 33-35).

Applicant also argues that motivation or suggestion for combining the reference is lacking. However, Negishi teaches in col. 1, lines 43-66 the need for cooling the electromagnetic actuators, and since Nishi uses electromagnetic actuators, Nishi would also need to cool the actuators.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Kim whose telephone number is (703) 305-0105. The examiner can normally be reached on Monday-Thursday from 6:30 AM to 4:00 PM. The examiner can also be reached on alternate Fridays during the same hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams, can be reached on (703) 308-2847. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.



Peter B. Kim
Patent Examiner
May 13, 2003



RUSSELL ADAMS
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